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Claims

1. A DNA sequence containing a gene encoding a protein, said gene being under the transcriptional control in said DNA sequence of a mammalian milk protein promoter which does not naturally control the transcription of said gene, said DNA sequence further comprising DNA enabling secretion of said protein.

2. The DNA sequence of claim 1, wherein said secretion-enabling DNA comprises a secretion signal-encoding sequence interposed between said gene and said promoter. *RE 4/15/86
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3. The DNA sequence of claim 1 wherein said milk protein is a milk serum protein or a casein protein.

4. The DNA sequence of claim 3 wherein said milk serum protein is a whey acid protein.

5. The DNA sequence of claim 1 wherein said signal encoding sequence is the signal encoding sequence naturally associated with said gene encoding said protein.

6. The DNA sequence of claim 1 wherein said signal encoding sequence is the signal encoding sequence naturally associated with said mammalian milk protein promoter.

7. The DNA sequence of claim 1 wherein said DNA sequence includes a transcriptional stop sequence.

8. The DNA sequence of claim 7 wherein said stop sequence is derived from SV40 virus DNA,

5 9. The DNA sequence of claim 7 wherein said stop sequence is contained in the polyadenylation sequence of SV40.

10. A mammalian embryo having a nucleus containing the DNA sequence of claim 1.

10 11. The DNA sequence of claim 1 wherein said protein is human tissue plasminogen activator or hepatitis B surface antigen.

15 12. A mammal in which the genome of the mammary glands of said mammal comprises a gene encoding a protein, said gene being under the transcriptional control of a mammalian milk protein promoter which does not naturally control the transcription of said gene, said genome comprising DNA enabling the secretion of said gene encoding said protein.

13. The mammal of claim 11, said mammal being a sheep, pig, goat, cow, or other ~~ruminant~~ mammals.

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14. The mammal of claim 11 wherein said gene is expressed in greater amounts during lactation than during pregnancy.

15. A method for producing a protein comprising the steps of:

(a) inserting into a mammalian embryo a DNA sequence comprising a gene encoding said protein, said gene being under the transcriptional control of a milk protein promoter which does not naturally control the transcription of said gene, said DNA sequence comprising DNA enabling secretion of said protein,

(b) allowing said embryo to develop into an adult mammal,

(c) inducing lactation in said mammal, or in a female descendant of said mammal in which said gene, promoter, and signal sequence are present in the mammary tissue genome,

(d) collecting milk of said lactating mammal, and

(e) isolating said protein from said collected milk.

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